संख्या. पी-63013/66/05/2022/मोड–।/सीसुबल 824-33

भारत सरकार, गृह मंत्रालय
महानिदेशालय सीमा सुरक्षा बल
(रसद निदेशालय: आधुनिकीकरण सैल)
(Email-comdtord@bsf.nic.in)
(Fax: 011-24367683)

ब्लाक संख्या . 10,
सीजीओ काम्पलैक्स,
लोधी रोड, नई दिल्ली–03

दिनांक 14 मार्च 2023

सेवा में,

महानिदेशक :– आसाम राईफल (through LOAR) , केन्द्रीय ओद्यौगिक सुरक्षा बल, केन्द्रीय रिजर्व पुलिस बल, भारतीय तिब्बत बोर्डर पुलिस, सशस्त्र सीमा सुरक्षा बल, राष्ट्रीय सुरक्षा गार्ड एवं पुलिस अनुसन्धान एवं विकास ब्योरो

विषय :– **अनुमोदित गुणात्मक आवश्यकता/ परीक्षण निर्देशों का प्रेषण।**

तकनीकी विशेषज्ञों के उप समूह द्वारा किए गये पुनः सूत्रीकरण एवं महानिदेशक सीमा सुरक्षा बल द्वारा अनुमोदित **"Hand Held Thermal Imager (Uncooled Version)"** उपकरण के पुनः सूत्रीकरण गुणात्मक आवश्यकता/परीक्षण निर्देशों को आपकी अग्रिम कार्यवाही हेतु प्रेषित किया जाता है।

इ.दे.सिंह
14/3/23
(इन्द्र देव सिंह)
उप महानिरीक्षक (रसद)

प्रतिलिपिः–

1. तकनीकी निदेशक
   The Technical Director
   राष्ट्रीय सूचना–विज्ञान केन्द्र, नोर्थ ब्लाक, गृह मंत्रालय, नई दिल्ली
   NIC, North Block, MHA
   New Delhi (द्वारा ई–मेल)
   (ई–मेल पता: mpsugandhi@nic.in)
   : आपसे अनुरोध है कि उक्त उपकरण के पुनः सूत्रीकरण गुणात्मक आवश्यकता/परीक्षण निर्देशों को गृह मंत्रालय की वैबसाईट [MHA website Division of MHA+ -Police Modernization Division- Qualitative Requirements- Qualitative Requirements of Machinery & Eqpt Items with Surveillance item] पर अपलोड करें एवं उक्त उपकरण के पुराने गुणात्मक आवश्यकता/ परीक्षण निर्देशों जोकि गृह मंत्रालय की वैबसाईट [MHA website Division of MHA+ - Police Modernization Division - Qualitative Requirements- Qualitative Requirements of Machinery & Eqpt Items with Surveillance item] **कम संख्या–64 पर अपलोड है को हटाने का श्रम करे।**
2. SO (IT), North Block, MHA
   (Through E-mail)
   (E-mail address: soit@nic.in
   : कृपया उपरोक्तानुसार कार्यवाही करने का श्रम करे।
3. तकनीकी विंग, सीमा सुरक्ष बल
   : आपसे अनुरोध है कि उक्त उपकरण के गुणात्मक आवश्यकता/ परीक्षण निर्देशों को सीमा सुरक्षा बल की वैबसाईट पर अपलोड करने का श्रम करें।
4. फाईल

Appendix-'A'

QRs & TDs OF HAND HELD THERMAL IMAGER (UNCOOLED VERSION)– REVISION

S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
A		**HAND HELD THERMAL IMAGER (UN-COOLED) SHORT RANGE**		
	I)	**GENERAL** Monocular (Un Cooled Short Range version)	To be physically checked by the BOOs.	Must be Monocular.
	a)	**Ruggedness** Should be rugged for operations as per JS55555 / JSS – 5855/ MIL Std 810H (for high & low temperature, humidity, shock, vibration and Bump test) or better and IP 67	Firm has to submit National / International accredited lab certificate for the same	HHTI must be rugged for operations as per JS55555 / JSS – 5855/ 810 H MIL Std/ better and IP 67
	b)	**Image** Have capability to produce real time picture.	To be physically checked by BOOs on Eye Piece as well as on external device.	It must produce real time picture.
	c)	**Carrying Case** Should have a ruggedized customized container for transportation and a soft carrying case for dust and rain protection.	To be physically checked by the BOOs. i) Transportation case placed at a height of minimum 2 mtr with HHTI inside and drop on a hard surface. Transportation case should not be deformed and have any crack. Eqpt should work properly. ii) Shower on Soft carrying case for rain protection no water content enter on Soft carrying case.	It must have a ruggedized customized container for transportation and a soft carrying case for dust and rain protection.
	d)	**Penetration** Penetrate darkness, haze and smoke.	To be physically checked by the BOOs. Switch on the system in different conditions like full dark night, haze and smoke. Observe the image on external LCD/LED screen like full dark night, haze and smoke. For creating the smoke condition BOOs should use smoke candles.	HHTI must be capable to see through darkness, haze and smoke
	e)	Not get damaged if faced towards sun accidentally.	To be physically checked by the BOOs. Switch on the system and direct towards the sun for 2 to 3 second. After this system should work properly.	It must not get damaged if faced towards sun accidently.
	f)	Be immune to glare of searchlights.	To be physically checked by the BOOs. Switch on the searchlight and throw its beam towards	System must be work properly.

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
			HHTI in operational mode for 2 to 3 sec. System should work properly.	
	g)	Have a suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	To be physically checked by the BOOs It must have suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	System must have a suitable tint to reduce eyestrain.
	h)	**Weight** 850 gm or less including Battery, Neck/Shoulder carrying strap , hand strap, OG Cover and Eye guard.	To be physically checked by the BOOs.	Weight of the system must be 850gm or less including Battery, **Neck/Shoulder** carrying strap , hand strap, OG Cover and Eye guard.
	i)	Should be able to be fixed on Tripod.	To be physically checked by the BOOs.	It must be able to be fixed on Tripod.
	II.	**TECHNICAL SPECIFICATION**		
	a)	**Detector** Micro bolometer or better. Detector element pixel pitch 12 µm or better.	Firm to provide OEM data sheet in this regard.	It must be12 µm or better .
	b)	**Resolution** FPA resolution 640 x 480 or better	Firm to provide OEM data sheet in this regard.	FPA resolution must have 640 x 480 or better
	c)	**Spectral range** 8-14 µm	Firm to provide OEM data sheet in this regard.	It must be spectral range between 8-14 µm.
	d)	**Field of view** 8°x6° (Maximum)	To be physically checked by the BOOs (Tested on Acceptance Test station of SIW BSF)	Field of view must be 8°x6° (Maximum)
	e)	**Digital Zoom** 4x or better	To be physically checked by the BOOs (Tested on Acceptance Test station of SIW BSF)	Digital Zoom must be 4x or better
	f)	**Ready time** 1minute or less	To be physically checked by BOOs.	Ready time must be 1minute or less.
	g)	**Reticule** Inbuilt reticule for range estimation.	To be physically checked by BOOs.	Reticule must be inbuilt for range estimation.
	h)	**Focusing** Manual	To be physically checked by BOOs.	Must have manual focusing.
	i)	**NUC** Shutter-less.	Firm to provide OEM certificate in this regard and to be physically checked by BOOs.	NUC must be Shutter-less.

S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
	j)	**Polarity** Black Hot and white Hot should be available.	To be physically checked by BOOs.	Black Hot and white Hot polarity must be available.
	k)	**Video output Connector** It should have provision for external video output connector	To be physically checked by BOOs.	Must be external video connector.
	l)	**Internal display** Advance high resolution OLED display having resolution minimum 640 x 480 or better	Firm has to submit OEM certificate in respect of the same.	Internal display must be advance high resolution OLED Internal display of resolution minimum 640 x 480 or better.
	III	**OPERATIONAL FEATURES**		
	a)	**Range** **Human** i. Detection :- 700 Mtr (Minimum) ii. Recognition :- 500 Mtr (Minimum)	To be physically checked by the BOOs. **Detection**: Group of 2-3 Jawans **placed at a distance of 2-3 meter apart** in camouflage uniform at the range of 700 meters and move the both hand up & down. Then move the Jawans horizontally with the same action. Movement of troops should be detected. Detection means – Ability to detect vehicles structures and any movement of men or animal. **Recognition:-** Move a group of 02-03 persons placed at a distance of 2-3 meters apart in camouflage uniform from a range of 500 meters and move the both hand up & down. Then move the group horizontally with the same action. Group of men should be recognized.	System must be Detect and Recognize of Human at the range of 700mtr and 500mtr (Minimum)
	b)	**Vehicle** i. Detection :1500 Mtr (Minimum) ii. Recognition : 700 Mtr(Minimum) (A vehicle of maximum overall length of 4010 mm, maximum overall width of 1540 mm and maximum overall height of 1875 mm.)	**Detection :-** To be physically checked by BOOs Moving the vehicle in horizontal direction at 1500 mtr movement of vehicle to be detected. Moving the vehicle in horizontal at 700 mtr and vehicle to be recognized.	System must be Detect and Recognize of Vehicle at the range of 1500mtr and 700mtr. (Minimum)
	c)	Operating temp Range : -20°C to +55°C	Firm should be submit the National/International Accredited lab certificate/report in respect of operating	Operating temp Range must be -20°C to +55°C

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
			Temp.	
	d)	Storage temp Range: -30°C to +60°C	Firm should be submit the National/International Accredited lab certificate/report in respect of Storage Temp.	Storage temp Range must be -30°C to +60°C .
	IV	**POWER SOURCE**		
	a)	It should Function on 110 volt to 270 v, 50 Hz AC mains through AC/DC Adopter.	To be physically checked by the BOOs. Connect the AC/DC adopter on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts.	It must function from 110 volt to 270 volt, 50 Hz AC mains through AC/DC Adopter
	b)	**Battery :** Should have rechargeable commercially available Lithium-based battery.	To be physically checked by the BOO.	Must be Lithium based battery.
	c)	**Battery performance :** The battery(s) should be able to run the system for 6 hours or more in operation mode on single charge.	To be physically checked by the BOO.	Rechargeable battery(s) must run the system for 6 hrs or more in operational mode on single charge.
	d)	**Spare batteries :** 02 spare batteries be provided.	Undertaking be given by the firm.	System must be provided with 2 spare batteries.
	e)	**Battery charger :** A smart and intelligent, universal charger for charging the battery from 110 volt to 270 volts 50 Hz AC mains along with DC charging facility from 12 volt to 48 volt DC (on entire range) should be provided. It should have "charge on" and "charge complete" indications during the charging of battery. The charger should be capable to charge the battery fully in ≤ 5 hours.	To be physically checked by the BOO Switch 'ON' the charger on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts. Again switch 'ON' the charger through DC power supply and check the out-put voltage by varying the in-put voltage from 12 to 48 volts (entire voltage range). Check the charger for 'Charge ON' and charge complete indications. Charge a fully discharged battery with the charger and note down the total time.	Battery Charger must have indication of "charge on" and "charge complete". . The charger must be capable to charge the battery fully in ≤ 5 hours.

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
	V.	**MISCELLANEOUS**		
	a)	User Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual, inspection standards be provided with the equipment	Firm to provide an operating user manual with the equipment and same will be physically checked by the BOO.	User Operation Manual/technical Manual must be provided.
	b)	Firm to provide spare part list with Part No. during supply of store	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
	c)	05 days base Workshop level training to minimum 10 technicians at OEM premises on full fledged running testing, diagnostic and calibration set up.	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
	d)	03 days operator level training should be provided at user defined location.	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
B.		**HAND HELD THERMAL IMAGER (UN-COOLED) LONG RANGE**		
	I.	**GENERAL** Binocular (Un Cooled Long Range version)	To be physically checked by the BOOs.	Must be Binocular.
	a)	**Ruggedness** Should be rugged for operations as per JS55555/ JSS-5855/ MIL Std 810H (for high & low temperature, humidity, shock, vibration and Bump test). or better and IP 67	Firm has to submit National / International accredited lab certificate for the same	System must be rugged for operations as per JS55555/ JSS-5855 / 810 H MIL Std / better and IP 67
	b)	**Image** Have capability to produce real time picture.	To be physically checked by BOOs on Eye Piece as well as on external device.	It must produce real time picture.
	c)	**Carrying Case** Should have a ruggedized customized container for transportation and a soft carrying case for dust and rain protection.	To be physically checked by the BOOs. i) Transportation case placed at a height of minimum 2 mtr with HHTI inside and drop on a hard surface. Transportation case should not be deformed and have any crack. Eqpt should work properly. ii) Shower on Soft carrying case for rain protection no water content enter on Soft carrying case.	It must be ruggedized customized container for transportation and a soft carrying case for dust and rain protection.
	d)	**Penetration** Penetrate darkness, haze and smoke.	To be physically checked by the BOOs. Switch on the system in different conditions like full	HHTI must be capable to see

S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
			dark night, haze and smoke. Observe the image on external LCD/LED screen like full dark night, haze and smoke. For creating the smoke condition BOOs should use smoke candles.	through darkness, haze and smoke
	e)	Not get damaged if faced towards sun accidentally.	To be physically checked by the BOOs. Switch on the system and direct towards the sun for 2 to 3 second. After this system should work properly.	It must not get damaged if faced towards sun accidently.
	f)	Be immune to glare of searchlights.	To be physically checked by the BOOs. Switch on the searchlight and throw its beam towards HHTI in operational mode for 2 to 3 sec. System should work properly.	System must be work properly.
	g)	Have a suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	To be physically checked by the BOOs It must have suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	System must be a suitable tint to reduce eyestrain.
	h)	**Weight** 1.5 kg or less including Battery, Shoulder/Neck carrying strap, hand strap, OG Cover and Eye guard.	To be physically checked by the BOOs.	Weight of the system must be 1.5 kg or less including Battery, Shoulder/Neck carrying strap , hand strap, OG Cover and Eye guard.
	i)	Should be able to be fixed on Tripod.	To be physically checked by the BOOs.	It must be able to be fixed on Tripod.
	II	**TECHNICAL SPECIFICATION**		
	a)	**Detector** Micro bolometer or better. Detector element pixel pitch 12 µm or better.	Firm to provide OEM data sheet in this regard.	It must have 12 µm or better .
	b)	**Resolution** FPA resolution 640 x 480 or better	Firm to provide OEM data sheet in this regard.	FPA resolution must have 640 x 480 or better
	c)	**Spectral range** 8-14 µm	Firm to provide OEM data sheet in this regard.	It must be spectral range between 8-14 µm.
	d)	**Field of view** Wide : 8^0 x 6^0 (minimum)	To be physically checked by the BOOs (Tested on Acceptance Test station of SIW BSF)	Optically achieved field of view must be.

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
		Narrow : 4^0 x 3^0 (maximum) (Note: Field of view should be achieved optically only.)		Wide : 8^0 x 6^0 (minimum) Narrow : 4^0 x 3^0 (maximum)
	e)	Optical Zoom : 2x (min) Digital Zoom : 4x or better	To be physically checked by the BOOs (Tested on Acceptance Test station of SIW BSF)	Zoom must be Optical Zoom : 2x (min) Digital Zoom : 4x or better
	f)	**Ready time** 1minute or less	To be physically checked by BOOs.	Ready time must be 1minute or less.
	g)	**Reticule** Inbuilt reticule for range estimation.	To be physically checked by BOOs.	Reticule must be inbuilt for range estimation.
	h)	**Focusing** Manual	To be physically checked by BOOs.	Must be manual focusing.
	i)	**NUC** Shutter-less.	Firm to provide OEM certificate in this regard and to be physically checked by BOOs.	NUC must be Shutter-less.
	j)	**Polarity** Black Hot and white Hot should be available.	To be physically checked by BOOs.	Black Hot and white Hot polarity must be available.
	k)	**Video output Connector** It should have provision for external video output connector	To be physically checked by BOOs.	Must be external video connector.
	l)	**Inter Pupillary Distance (IPD)** Equipment should have digital or manual IPD adjustment feature in it.	To be physically checked by the BOO	This feature should be available in the equipment.
	m)	**Internal display** Advance high resolution OLED display having resolution 640 x 480 or better	Firm has to submit OEM certificate in respect of the same.	System must be advance high resolution OLED Internal display of resolution 640 x 480 or better.
	III.	**OPERATIONAL FEATURES**		
	a)	**Range**: **Human** i. Detection : 2000 mtr (Minimum) ii. Recognition :1000 mtrs(Minimum)	To be physically checked by the BOOs. Detection: Place 02-03 Jawans at a distance of 2-3 meter apart in camouflage uniform at the range of 2000 meters and move the both hand up & down. Then move the Jawan horizontally with the same action. Movement	System must be Detect and Recognize of Human at the range of 2000 mtr and 1000 mtr (Minimum)

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
			of Jawans should be detected. **Detection means** – Ability to detect vehicles structures and any movement of men or other movable things. **Recognition:-** Move a group of 03 persons at a distance of 2-3 meters apart in camouflage uniform from a range of 1000 meters and move the both hand up & down. Then move the group horizontally with the same action. Group of men should be recognized.	
	b)	**Vehicle** i. Detection : 3000 Mtr (Minimum) ii. Recognition : 1500 Mtr(Minimum) (A vehicle of maximum overall length of 4010 mm, maximum overall width of 1540 mm and maximum overall height of 1875 mm.)	Detection :- To be physically checked by BOOs Moving the vehicle in horizontal direction at 3000 mtr movement of vehicle to be detected. Moving the vehicle in horizontal at 1500 mtr and vehicle to be recognized.	System must be Detect and Recognize of B Type Vehicle at the range of 3000mtr (Minimum) and 1500mtr. (Minimum)
	c)	**Operating temp Range** -20°C to +55°C	Firm should be submit the National/International Accredited lab certificate/report in respect of operating Temp.	Operating temp Range must be -20°C to +55°C
	d)	**Storage temp Range** -30°C to +60°C	Firm should be submit the National/International Accredited lab certificate/report in respect of Storage Temp.	Storage temp Range must be -30°C to +60°C .
	IV.	**POWER SOURCE**		
	a)	It should Function on 110 volt to 270 v, 50 Hz AC mains through AC/DC Adopter.	To be physically checked by the BOOs. Connect the AC/DC adopter on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts.	It must function from 110 volt to 270 volt, 50 Hz AC mains through AC/DC Adopter
	b)	**Battery** Should have rechargeable commercially available Lithium-based battery.	To be physically checked by the BOO.	Must be Lithium based battery.
	c)	**Battery performance** The battery(s) should be able to run the system for 6 hours or more in operation mode	To be physically checked by the BOO.	Rechargeable battery(s) must run the system for 6 hrs or more in operational mode on single

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
		on single charge.		charge.
	d)	**Spare batteries** 02 spare batteries be provided.	Undertaking be given by the firm.	System must be provided with 2 spare batteries.
	e)	**Battery charger** A smart and intelligent, universal charger for charging the battery from 110 volt to 270 volts 50 Hz AC mains along with DC charging facility from 12 volt to 48 volt DC (on entire range) should be provided. It should have "charge on" and "charge complete" indications during the charging of battery. The charger should be capable to charge the battery fully in ≤ 5 hours.	To be physically checked by the BOO Switch 'ON' the charger on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts. Again switch 'ON' the charger through DC power supply and check the out-put voltage by varying the in-put voltage from 12 to 48 volts (entire voltage range). Check the charger for 'Charge ON' and charge complete indications. Charge a fully discharged battery with the charger and note down the total time.	Battery Charger must be equipped with "charge on" and "charge complete" indications during the charging of battery. The charger must be capable to charge the battery fully in ≤ 5 hours.
	V.	**MISCELLANEOUS**		
	a)	User Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual, inspection standards be provided with the equipment	Firm to provide an operating user manual with the equipment and same will be physically checked by the BOO.	User Operation Manual/technical Manual must be provided.
	b)	Firm to provide spare part list with Part No. during supply of store	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
	c)	05 days base Workshop level training to minimum 10 technicians at OEM premises on full fledged running testing, diagnostic and calibration set up.	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
	d)	03 days operator level training should be provided at user defined location.	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
C.		**HAND HELD THERMAL IMAGER (UN-COOLED) LONG RANGE AUTO FOCUS**		
	I.	**GENERAL** Binocular (Un Cooled Long Range version)	To be physically checked by the BOOs.	Must be Binocular.

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
	a)	**Ruggedness** Should be rugged for operations as per JS55555 or JSS-5855/ MIL Std 810H (for high & low temperature, humidity, shock, vibration and Bump test). or better and IP 67	Firm has to submit National / International accredited lab certificate for the same	System must be rugged for operations as per JS55555/ JSS-5855/ 810 H MIL Std or better and IP 67
	b)	**Image** Have capability to produce real time picture.	To be physically checked by BOOs on Eye Piece as well as on external device.	It must produce real time picture.
	c)	**Carrying Case** Should have a ruggedized customized container for transportation and a soft carrying case for dust and rain protection.	To be physically checked by the BOOs. i) Transportation case placed at a height of minimum 2 mtr with HHTI inside and drop on a hard surface. Transportation case should not be deformed and have any crack. Eqpt should work properly. ii) Shower on Soft carrying case for rain protection no water content enter on Soft carrying case.	It must be ruggedized customized container for transportation and a soft carrying case for dust and rain protection.
	d)	**Penetration** Penetrate darkness, haze and smoke.	To be physically checked by the BOOs. Switch on the system in different conditions like full dark night, haze and smoke. Observe the image on external LCD/LED screen like full dark night, haze and smoke. For creating the smoke condition BOOs should use smoke candles.	HHTI must be capable to see through darkness, haze and smoke
	e)	Be immune to glare of searchlights.	To be physically checked by the BOOs. Switch on the searchlight and throw its beam towards HHTI in operational mode for 2 to 3 sec. System should work properly.	System must be work properly.
	f)	Have a suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	To be physically checked by the BOOs It must have suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	System must be a suitable tint to reduce eyestrain.
	g)	**Weight** Upto 02 kg or less including Battery Neck/Shoulder carrying strap, hand strap, OG Cover and Eye guard.	To be physically checked by the BOOs.	Weight of the system must be upto 02 kg or less including Battery Neck/ Shoulder carrying strap , hand strap, OG Cover and

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
				Eye guard.
	h)	Should be able to be fixed on Tripod.	To be physically checked by the BOOs.	It must be able to be fixed on Tripod.
	II.	**TECHNICAL SPECIFICATION**		
	a)	**Detector** Micro bolometer or better. Detector element pixel pitch 12 µm or better.	Firm to provide OEM data sheet in this regard.	It must have 12 µm or better .
	b)	**Resolution** FPA resolution 640 x 480 or better	Firm to provide OEM data sheet in this regard.	FPA resolution must have 640 x 480 or better
	c)	**Spectral range** 8-14 µm	Firm to provide OEM data sheet in this regard.	It must be spectral range between 8-14 µm.
	d)	**Field of view** Wide : 8^0 x 6^0 (minimum) Narrow : 4^0 x 3^0 (maximum) (Note: Field of view should be achieved optically only.)	To be physically checked by the BOOs (Tested on Acceptance Test station of SIW BSF)	Optically achieved field of view must be. Wide : 8^0 x 6^0 (minimum) Narrow : 4^0 x 3^0 (maximum)
	e)	Optical Zoom : 2x (min) Digital Zoom : 4x or better	To be physically checked by the BOOs (Tested on Acceptance Test station of SIW BSF)	Zoom must be Optical Zoom : 2x (min) Digital Zoom : 4x or better
	f)	**Ready time** 1minute or less	To be physically checked by BOOs.	Ready time must be 1minute or less.
	g)	**Reticule** Inbuilt reticule for range estimation.	To be physically checked by BOOs.	Reticule must be inbuilt for range estimation.
	h)	**Focusing** Auto	To be physically checked by BOOs.	Must be Automatic Focusing.
	i)	**NUC** Shutter-less.	Firm to provide OEM certificate in this regard and to be physically checked by BOOs.	NUC must be Shutter-less.
	j)	**Polarity** Black Hot and white Hot should be available.	To be physically checked by BOOs.	Black Hot and white Hot polarity must be available.
	k)	**Video output Connector** It should have provision for external video output connector	To be physically checked by BOOs.	Must be external video connector.

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
	l)	**Inter Pupillary Distance (IPD)** Equipment should have digital or manual IPD adjustment feature in it.	To be physically checked by the BOO	This features should be available in the equipment.
	m)	**Internal display** Advance high resolution OLED display having resolution 640 x 480 or better	Firm has to submit OEM certificate in respect of the same.	System must be advance high resolution OLED Internal display of resolution 640 x 480 or better.
	III.	**OPERATIONAL FEATURES**		
	a)	**Range**: **Human** i. Detection: 2000 mtr (Minimum) ii. Recognition:1000 mtrs (Minimum)	To be physically checked by the BOOs. Detection: Placed 02-03 Jawan at a mutual distance of 2-3 meters apart in camouflage uniform at the range of 2000 meters and move the both hand up & down. Then move the Jawan horizontally with the same action. Movement of Jawans should be detected. **Detection means** – Ability to detect vehicles structures and any movement of men or other movable things. **Recognition:-** Move a group of 03 persons at a distance of 2-3 meters apart in camouflage uniform from a range of 1000 meters and move the both hand up & down. Then move the group horizontally with the same action. Group of men should be recognized.	System must be Detect and Recognize of Human at the range of 2000mtr and 1000mtr (Minimum)
	b)	**Vehicle** i. Detection :3000 Mtr (Minimum) ii. Recognition : 1500 Mtr(Minimum) (A vehicle of maximum overall length of 4010 mm, maximum overall width of 1540 mm and maximum overall height of 1875 mm.)	Detection :- To be physically checked by BOOs Moving the vehicle in horizontal direction at 3000 mtr movement of vehicle to be detected. Recognition:- Moving the vehicle in horizontal at 1500 mtr and vehicle to be recognized.	System must be Detect and Recognize of B Type Vehicle at the range of 3000mtr (Minimum) and 1500mtr. (Minimum)
	c)	**Operating temp Range** -20°C to +55°C	Firm should be submit the National/International Accredited lab certificate/report in respect of operating Temp.	Operating temp Range must be -20°C to +55°C

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
	d)	**Storage temp Range** -30°C to +60°C	Firm should be submit the National/International Accredited lab certificate/report in respect of Storage Temp.	Storage temp Range must be -30°C to +60°C .
	IV.	**POWER SOURCE**		
	a)	It should Function on 110 volt to 270 v, 50 Hz AC mains through AC/DC Adopter.	To be physically checked by the BOOs. Connect the AC/DC adopter on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts.	It must function from 110 volt to 270 volt, 50 Hz AC mains through AC/DC Adopter
	b)	**Battery** Should have rechargeable commercially available Lithium-based battery.	To be physically checked by the BOO.	Must be Lithium based battery.
	c)	**Battery performance** The battery(s) should be able to run the system for 6 hours or more in operation mode on single charge.	To be physically checked by the BOO.	Rechargeable battery(s) must run the system for 6 hrs or more in operational mode on single charge.
	d)	**Spare batteries** 02 spare batteries be provided.	Undertaking be given by the firm.	System must be provided with 2 spare batteries.
	e)	**Battery charger** A smart and intelligent, universal charger for charging the battery from 110 volt to 270 volts 50 Hz AC mains along with DC charging facility from 12 volt to 48 volt DC (on entire range) should be provided. It should have "charge on" and "charge complete" indications during the charging of battery. The charger should be capable to charge the battery fully in ≤ 5 hours.	To be physically checked by the BOO Switch 'ON' the charger on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts. Again switch 'ON' the charger through DC power supply and check the out-put voltage by varying the in-put voltage from 12 to 48 volts (entire voltage range). Check the charger for 'Charge ON' and charge complete indications. Charge a fully discharged battery with the charger and note down the total time.	Battery Charger must be equipped with "charge on" and "charge complete" indications during the charging of battery. The charger must be capable to charge the battery fully in ≤ 5 hours.
	V.	**MISCELLANEOUS**		
	a)	User Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual, inspection standards be provided with the equipment	Firm to provide an operating user manual with the equipment and same will be physically checked by the BOO.	User Operation Manual/technical Manual must be provided.

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
	b)	Firm to provide spare part list with Part No. during supply of store	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
	c)	05 days base Workshop level training to minimum 10 technicians at OEM premises on full fledged running testing, diagnostic and calibration set up.	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
	d)	03 days operator level training should be provided at user defined location.	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
D.		**THERMAL IMAGER (UN-COOLED) LONG RANGE COMPATIBLE WITH CIBMS**		
	I.	**GENERAL** Thermal imager (Un Cooled) integrated with Day Camera , LRF, DMC & GPS in one housing.	To be physically checked by the BOOs.	Must be Thermal imager (Un Cooled) integrated with Day Camera, LRF, DMC & GPS in one housing.
	a)	**Ruggedness** Should be rugged for operations as per JS55555 / JSS-5855/ MIL Std 810H (for high & low temperature, humidity, shock, vibration and Bump test) or better and IP 67.	Firm has to submit National / International accredited lab certificate for the same	System must be rugged for operations as per JS55555/JSS-5855/ 810 H MIL Std/ better and IP 67.
	b)	**Image** Have capability to produce real time picture.	To be physically checked by BOOs	It must produce real time picture.
	c)	**Carrying Case** Should have a ruggedized customized container for transportation and a soft carrying case for dust and rain protection.	To be physically checked by the BOOs. i) Transportation case placed at a height of minimum 2 mtr with HHTI inside and drop on a hard surface. Transportation case should not be deformed and have any crack. Eqpt should work properly. ii) Shower on Soft carrying case for rain protection no water content enter on Soft carrying case.	It must have a ruggedized customized container for transportation and a soft carrying case for dust and rain protection.
	d)	**Penetration** Penetrate darkness, haze and smoke.	To be physically checked by the BOOs. Switch on the system in different conditions like full dark night, haze and smoke. Observe the image on external LCD/LED screen like full dark night, haze and smoke. For creating the smoke condition BOOs should use smoke candles.	HHTI must be capable to see through darkness, haze and smoke

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
	e)	Not get damaged if faced towards sun accidentally.	To be physically checked by the BOOs. Switch on the system and direct towards the sun for 2 to 3 second. After this system should work properly.	It must not get damaged if faced towards sun accidently.
	f)	Be immune to glare of searchlights.	To be physically checked by the BOOs. Switch on the searchlight and throw its beam towards HHTI in operational mode for 2 to 3 sec. System should work properly.	System must be work properly.
	g)	Should be able to be fixed on Pole /Mast	To be physically checked by the BOOs.	It must be able to be fixed on Pole /Mast
	h)	**Weight** 3.5 kg or less.	To be physically checked by the BOOs.	Weight of the system must be 3.5 kg or less.
	i)	Operating temp Range : -20°C to +55°C	Firm should be submit the National/International Accredited lab certificate/report in respect of operating Temp.	Operating temp Range must be -20°C to +55°C
	j)	Storage temp Range: -30°C to +60°C	Firm should be submit the National/International Accredited lab certificate/report in respect of Storage Temp.	Storage temp Range must be -30°C to +60°C .
	II.	**THERMAL CAMERA**		
	a)	**Detector** Micro bolometer or better. Detector element pixel pitch 12 µm or better.	Firm to provide OEM data sheet in this regard.	It must have 12 µm or better .
	b)	**Resolution** FPA resolution 640 x 480 or better	Firm to provide OEM data sheet in this regard.	FPA resolution must have 640 x 480 or better
	c)	**Spectral range** 8-14 µm	Firm to provide OEM data sheet in this regard.	It must have spectral range between 8-14 µm.
	d)	**Field of view** Wide : 8^0 x 6^0 (minimum) Narrow : 4^0 x 3^0 (maximum)	To be physically checked by the BOOs (Tested on Acceptance Test station of SIW BSF)	Field of view must be Wide : 8^0 x 6^0 (minimum) Narrow : 4^0 x 3^0 (maximum)
	e)	**Optical Zoom** 2x (min) **Digital Zoom** 4x or better	To be physically checked by the BOOs (Tested on Acceptance Test station of SIW BSF)	Zoom must be Optical Zoom : 2x (min) Digital Zoom : 4x or better

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
	f)	**Ready time** 1minute or less	To be physically checked by BOOs.	Ready time must be 1minute or less.
	g)	**Reticule** Inbuilt reticule for range estimation.	To be physically checked by BOOs.	Reticule must be inbuilt for range estimation.
	h)	**Focusing** Auto	To be physically checked by BOOs.	Focusing must be Automatically
	i)	**NUC** Shutter-less.	Firm to provide OEM certificate in this regard and to be physically checked by BOOs.	NUC must be Shutter-less.
	j)	**Polarity** Black Hot and white Hot should be available.	To be physically checked by BOOs.	Black Hot and white Hot polarity must be available.
	k)	**Video output Connector** It should have provision for external video output connector	To be physically checked by BOOs.	Must be external video connector.
	l)	**RANGE** **human**		
		i) Detection 2000 mtr.(Minimum)	To be physically checked by the BOOs. Place 02-03 Jawans at a distance of 02-03 meters apart in camouflage uniform at the range of 2000 meters and move the both hand up & down. Then move the Jawan horizontally with the same action. Movement of Jawans should be detected. **Detection means** – Ability to detect vehicles structures and any movement of men or other movable things.	Detection must be 2000 mtr or more.
		ii) Recognition 1000 Mtrs.(Minimum)	To be physically checked by the BOOs. Move a group of 03 persons at a distance 02-03 meter apart in camouflage uniform from a range of 1000 meters and move the both hand up & down. Then move the group horizontally with the same action. Group of men should be recognized.	Recognition must be 1000mtr or more.
	m)	**Vehicle**		
		i) Detection 4000 Mtr (Minimum)	To be physically checked by BOOs Moving the vehicle in horizontal direction at 4000 mtr	Detection must be minimum 4000 mtr

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
		(A vehicle of maximum overall length of 4010 mm, maximum overall width of 1540 mm and maximum overall height of 1875 mm.)	movement of vehicle to be detected.	
		ii) Recognition 2000 Mtr(Minimum)	To be physically checked by the BOOs. Moving the vehicle in horizontal at 2000 mtr and vehicle to be recognized.	Recognition must be minimum 2000mtr
	III.	**DAY CAMERA**		
	a)	Colour Camera	To be physically checked by BOOs	Must be Colour Camera.
	b)	**Resolution** 754 X 576 (Min) or better	Firm has to submit OEM certificate in respect of the same .	Resolution must be 754 X 576 (Min) or better.
	c)	**Digital Zoom** 4x or better	To be physically check by the BOO. (Tested on Acceptance Test station of SIW BSF)	Digital zoom must be 4x or better.
	d)	**Optical Zoom** 5x or better	To be physically check by the BOO. (Tested on Acceptance Test station of SIW BSF)	Optical Zoom must be 5x Continuous or better.
	e)	**Focusing** Automatically	To be physically checked by BOOs	System must be Auto Focus.
	f)	**RANGE :** **Human**		
		i) Detection 2000 mtr or better	To be physically checked by the BOOs. Place 02-03 Jawans at a distance 02-03 meter in camouflage uniform at the range of 2000 meters and move the both hand up & down. Then move the Jawan horizontally with the same action. Movement of Jawans should be detected. **Detection means** – Ability to detect vehicles structures and any movement of men or other movable things.	Detection must be 2000 mtr or more.
		ii) Recognition 1000mtr or better	To be physically checked by the BOOs. Move a group of 03 persons in camouflage uniform from a range of 1000 meters and move the both hand up & down. Then move the group horizontally with the same action. Group of men should be recognized.	Recognition must be 1000mtr or more.

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
		iii) Identification 750 Mtrs or better	To be physically checked by BOOs Move a group of 03 persons with weapon at a distance of 750 Mtrs. Day camera should identify the presence of men with weapon and colour of the dress.	Identification must be 750 mtr or more.
	g)	**Vehicle**		
		i) Detection 4 Km or better (A vehicle of maximum overall length of 4010 mm, maximum overall width of 1540 mm and maximum overall height of 1875 mm.)	To be physically checked by BOOs Moving the vehicle in horizontal direction at 4000 mtr movement of vehicle to be detected.	Detection must be 4 km or more.
		ii) Recognition 2 Km or better	To be physically checked by the BOOs. Moving the vehicle in horizontal at 2000 mtr and vehicle to be recognized.	Detection must be 2km or more.
		iii) Identification 1 Km or better	To be physically checked by BOOs Place a vehicle (size as per QR) at a distance of 1 Km. Day camera should identify type of vehicle with colour.	Detection must be 1 km or more.
	IV	**DIGITAL MAGNETIC COMPASS (DMC)**		
		DMC should be provided for auto Northing. Accuracy should be $\leq 1^0$.	Switch 'ON' the Thermal Imager and do auto northing. Note down the bearing of a point with the help of compass. Again check the bearing of that point through inbuilt DMC and then compare both the readings for accuracy.	DMC should be provided for auto Northing. Accuracy should be $\leq 1^0$.
	V.	**GLOBAL POSITIONING SYSTEM (GPS)**		
		GPS to provide own position during initialization. It should give co-ordinates in Lat-Lon and Indian Military GR system. Accuracy should be 5 meters or less.	To be physically checked by BOOs.	GPS to provide own position during initialization. It should give co-ordinates in Lat-Lon and Indian Military GR system. Accuracy should be 5 meters or less.
	VI.	**LASER RANGE FINDER (LRF)**		
		LRF (class 1 eye safe) should be provided for	To be physically checked by BOOs.	LRF (class 1 eye safe) should be

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
		finding range of any target/object upto 4000 meters or better with accuracy of ± 5 Mtrs or better.		provided for finding range of any target/object upto 4000 meters or better with accuracy of ± 5 Mtrs or better.
	VII.	**PAN & TILT MECHANISM**	**PAN & TILT MECHANISM**	**PAN & TILT MECHANISM**
	a)	High precision motorized pan and tilt unit with variable speed facility.	To be physically checked by BOOs.	High precision motorized pan and tilt unit with variable speed facility.
	b)	Azimuth (Pan) for 360^0 with variable speed of 1^0 to 40^0/Sec.	To be physically checked by BOOs.	Azimuth (Pan) for 360^0 with variable speed of 1^0 to 40^0/Sec.
	c)	Elevation (Tilt) for $+25^0$ (Min) & -45^0 (Min) with variable speed of 1^0 to 15^0/Sec.	To be physically checked by BOOs.	Elevation (Tilt) for $+25^0$ (Min) & -45^0 (Min) with variable speed of 1^0 to 15^0/Sec.
	VII.	**CONTROL DISPLAY UNIT (CDU)**		
	a)	CDU must be comprising of a ruggedized LCD colour display of size 15 inch (min).	To be physically checked by BOO.	CDU must be comprising of a ruggedized LCD colour display of size 15 inch (min).
	b)	CDU should have the facility to show the map in the background correlated with the video of the camera.	To be physically checked by BOO.	CDU must have the facility to show the map in the background correlated with the video of the camera.
	c)	A suitable provision of the control keys or joystick should be provided to operate the system remotely with comfort.	To be physically checked by BOO.	CDU must have a suitable provision of the control keys or joystick should be provided to operate the thermal Imager remotely with comfort.
	d)	CDU should have recovery option in the system itself whenever operating software gets corrupted. Operating System Software must be provided by OEM.	To be physically checked by BOO.	CDU must have recovery option in the system itself whenever operating software gets corrupted. Operating System Software must be provided by OEM.
	e)	CDU should have the provision to control the operation of day & night camera and Pan &	To be physically checked by BOO.	CDU must have the provision to control the operation of day &

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
		Tilt system.		night camera and Pan & Tilt system.
	f)	CDU should have scan around facility and automatically scan the operator defined sector whenever required.	To be physically checked by BOO.	CDU must have scan around facility and automatically scan the operator defined sector whenever required.
	g)	CDU must incorporate built in test equipment (BITE)	To be physically checked by BOO.	CDU must incorporate built in test equipment (BITE)
	h)	CDU should have ports for external PC interface, LAN and digital & analogue video out.	To be physically checked by BOO.	CDU must have ports for external PC interface, LAN and digital & analogue video out.
	i)	Video Recording Capability: Inbuilt storage memory of 2TB (min) exclusively to store the video should be provided in the console. The system should have facility to retrieve the stored data.	To be physically checked by BOO.	Video Recording Capability: Inbuilt storage memory of 2TB (min) exclusively to store the video should be provided in the console. The system should have facility to retrieve the stored data.
	IX.	**NETWORK CONNECTIVITY**		
		Integrate with available IP Network through LAN with video streaming , Video recording and all control	To be physically checked by BOO. Integrate with available IP Network through LAN with video streaming , Video recording and all control	Must be able to integrate with available IP Network through available LAN with video streaming , Video recording and all controls.
	X.	**POWER SOURCE**		
		It should Function on 110 volt to 270 v, 50 Hz AC mains through AC/DC Adopter and UPS. (UPS back up 30 Minutes minimum)	To be physically checked by BOO. It should Function on 110 volt to 270 v, 50 Hz AC mains through AC/DC Adopter and UPS. (UPS back up 30 Minutes minimum)	It should Function on 110 volt to 270 v, 50 Hz AC mains through AC/DC Adopter and UPS. (UPS back up 30 Minutes minimum.
	XI.	**MISCELLANEOUS**		
	a)	User Operation Manual/technical Manual - Detailed operators instructions, Technical	Firm to provide an operating user manual with the equipment and same will be physically checked by	User Operation Manual/technical Manual must be provided.

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S/No		Qualitative Requirements	Trial Directives	Result Expected/Desired
		literature, Maintenance manual, inspection standards be provided with the equipment	the BOO.	
	b)	Firm to provide spare part list with Part No. during supply of store	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
	c)	05 days base Workshop level training to minimum 10 technicians at OEM premises on full fledged running testing, diagnostic and calibration set up.	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.
	d)	03 days operator level training should be provided at user defined location	Firm to submit an undertaking certificate in this regard.	Firm must be provide undertaking in this regard.

(B K Mehta), ADG (Log), BSF	(Happy Verma), Comdt Ordnance, BSF	(Ajeet Kumar), Comdt. (SIW), BSF	(Dr. Raveesh Kumar), PSO(W), BPR&D
(K Saha), Astt. Director,DCPW	(Subhash Gautam) IRDE, DRDO, Dehradun attended through VC	(Vinay Verma), DC, CRPF	(Nafees Ahmad), DC CISF
(S P Singh), TC, NSG	(Gaurav Drall), AC, SIW, BSF	(Ajay Dhyani), AC/ATO, BSF	(Inspr/RM Manish Raj), SIW, BSF
(Inspr/Tele Kapoor Singh), ITBP	(Nb/Sub D P Mishra), Assam Rifle	(ASI/Comn R K Swami), SSB	

Approved /Not approved

Director General
Border Security Force